

## Learning Intentions

I understand that the body has feedback mechanisms to maintain homeostasis

I can explain both positive and negative feedback loops and provide an example of each.

## Homeostasis

The maintenance of body systems in a state of balance and equilibrium

Homeostasis ensures that the internal environment remains steady despite changes externally via FEEDBACK mechanism

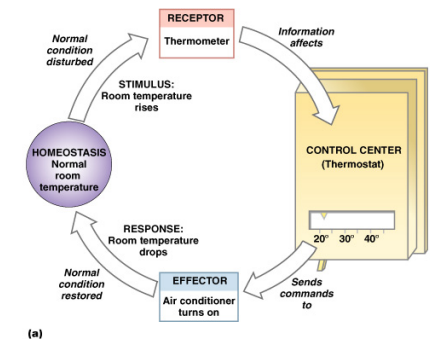
## Anatomy, Physiology, & Pathophysiology

- Anatomy = Describes the **structures** of the body
  - What they are made of
  - Where they are located
  - Associated structures
- Physiology = Is the study of:
  - **Functions** of anatomical structures
  - Individual and cooperative **functions**
- Pathophysiology = when our physiological symptoms are not working the way they are supposed to.



## FEEDBACK SYSTEMS

- 3 basic components:
- **Receptor**: structure that monitors changes in a controlled condition; sends info. to control center
- **Control center**: receives information and sends output (via nerve impulses or chemical signals) to effectors
- **Effector**: structure that receives output and produces a response that changes the controlled condition
- Two types: negative & positive



# Feedback Systems

## Negative Feedback

The response of the **effector** negates the **stimulus**

Body is brought back into homeostasis

**Normal range** is achieved

Negative feedback control leads to **STABILITY**

Example: sweating, shivering



## Positive Feedback

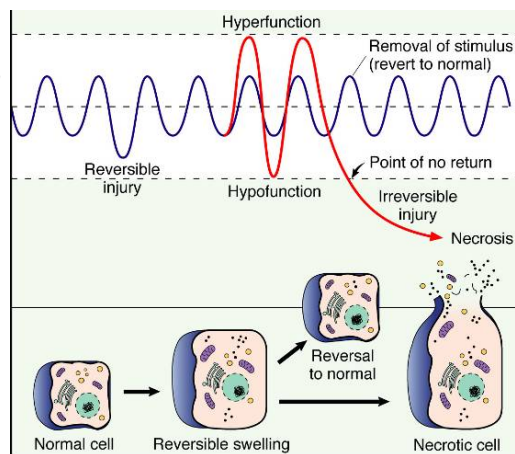
- The response of the **effector** increases/ *reinforces* change of the **stimulus**
- Body is moved away from homeostasis = **Normal range** is lost
- Used to speed up processes
- Leads to **INSTABILITY** because the output becomes progressively stronger as it is fed back and re-amplified.
- Examples: clotting cascade, labour



Example of positive feedback: Story of being a Doula

## Disease

- Failure of body systems to function within a "normal" range results in disease



## Tolerance

- Range of tolerance - range of a specific environmental variable that an individual can survive
- i.e. compensatory mechanisms maintain the system in a dynamic steady state
- Tolerance to specific disturbances is influenced by genetic make-up of individual
- above and below the critical values are ranges beyond tolerance which an individual will eventually die

## Summary so far

- Anatomy = structure; Physiology = function
- Pathophysiology = disordered function
- Homeostasis is a *state of equilibrium* that needs work to restore balance
  - Negative feedback negates the stimulus
  - Positive feedback reinforces the stimulus
    - Gets everything finished with quicker
  - Genetically determined tolerance range
- Failure results in pathophysiology, disease or death

## Building Positive and Negative Feedback Loops

ask: Research a feedback mechanism (Does not need to be found in humans).

complete the following:

Design a model or diagram or write a short summary about this mechanism.

Explain if it is a positive or negative feedback loop?

Explain why this mechanism is important?

To get started you may want to consider thinking about the following questions:

What happens when you are cold? What happens when you are hot?

What happens when you don't drink enough water? What about when you drink too much water?

What organ system may be involved in regulation of water balance?

Take image of your final produce and upload to fresh grade as part of your portfolio and include your written explanation.